- pKas:

HOOC DEHCYKR ST NH_3^+

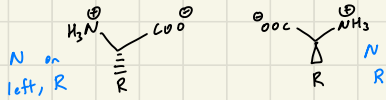
2 4 4 6.9 8 10 10.5 11 12 12.5 13 17 9

only ones that'll prot/deprotonate irl

Avg Human pH = 7.4

- AA stereochemistry:
  - most are S
  - except Cys (CR bc Sulfur outranks Oxygen)
  - & except Gly (CR group is H/achiral)

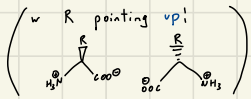
so with R group pointing down, this looks like:



N on left, R group back

N on right, R group in front

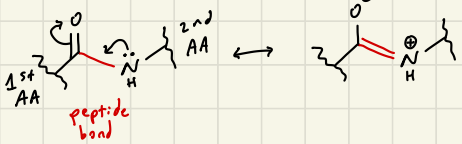
(w R pointing up:



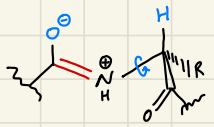
(Q)

- 1,3-allylic strain:

peptide bonds have double bond resonance,

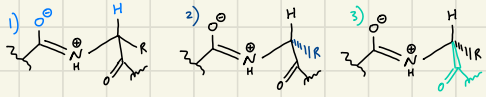


so prefer when H is coplanar w O^-



Steps for drawing:

1) draw whole thing flat w O^- & C coplanar H
2) figure out if R group back or forward?
3) then C terminal bond opposite direction from R



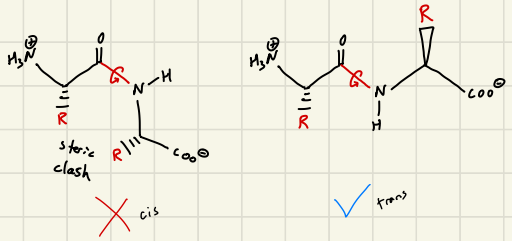
2° structure

α-helices & β-sheets exist.

(ω)

- cis vs. trans peptide bonds:

rotate peptide bond to avoid R groups' steric clash

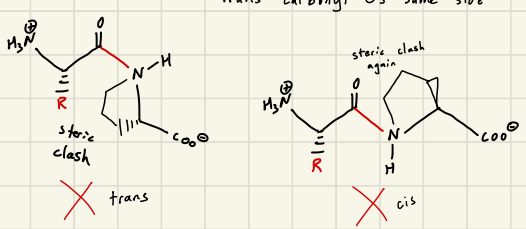


All amino acids EXCEPT P: cis = R groups clash

trans = R groups diff sides

Proline: cis = carbonyl O's diff sides

trans = carbonyl O's same side



For peptides with proline, cis & trans equally unfavorable bc steric clash either way

- protein folding driving force = entropic consequences of hydrophobic effect
  - entropic → H_2O disorder w hydrophilic exterior
  - hydrophobic effect → hydrophobic AAs hide in protein interior